A Review of Survey Based on Integration of Web of Things Services with E-Health for Knowledge Society

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Abstract

The study aims of producing a knowledge society (KS) through e-Health (EH) with the support of web of things services. At the beginning of the study a discussion of EH system with its elements produced first. For effective EH system, integration of web of things services with EH system is essential which is highlight in the paper. Web of things services such as assessment and evaluation, wikis makes the user enable of creating editable contents in the form of highly searchable knowledge-bases. Group work, Question & Answer (Q & A) sessions are performed by social networking and discussion forums. RSS feeds, Tags, Podcasts and Videocasts are considered as supporting services to speed up the knowledge management process. Web of things services can apply artificial intelligence (AI) technique to speed up the process. The integration is expected to create the KS and the global knowledge warehouse

Keywords: E-Health / Web of things; knowledge society; interoperability; ICT; semantic web of things.

المستخلص

تهدف هذه الدراسة لتقديم مجتمع المعرفة (KS) من خلال الصحة الإلكترونية (EH) بدعم من خدمات شبكة الأشياء. في البداية سوف يتم تقديم مناقشة نظام الصحة الاكتروني مع عناصره الاولى. لنظام الصحة الاكتروني فعالة ، دمج خدمات من شبكة الاشياء مع نظام الصحة الاكتروني أمر ضروري جدا وسوف يسلط الضوء عليه في هذه الدراسة. خدمات من شبكة أشياء مثل التقدير والتقييم، wiki تجعل المستخدم قادر على خلق محتويات قابلة للتعديل على هيئة قواعد المعرفة عالية البحث. ان العمل الجماعي وجلسات الاسئلة والاجوبة تنفذ عن طريق الشبكات الاجتماعية. خلاصات العمل (RSS) ، Tags ، البودكاست وبث الفيديو تعتبر خدمات داعمة لزيادة لتسريع عملية إدارة المعرفة. خدمات من شبكة أشياء يمكن تطبق تقنية الذكاء الاصطناعية (AI) لتسريع المعالجة. أن التكامل من المتوقع لإنشاء مجتمع المعرفة KS ومستودع المعرفة العامة.

1. Introduction

E-Health (EH) is just-in-time learning providing comprehensive, individualized, dynamic health content in real time thus intensifies communities of knowledge, linking patient and doctors with experts. EH aims at replacing old-fashioned place/ time predetermined health with a just-in-time on-demand/customized process of health. The incorporation of web of things technology in EH can create communities of practice where the community knowledge creates the knowledge society (KS). The second phase of EH provides collaboration, much improved communication between users to build up organizational as well as individual skills and knowledge. Produce from this societal knowledge or collaboration community. Web of things' services play important role in collaboration to give a new essence to health. Most of the web of things technologies and tools is widely used in EH system to allow the doctors to create social network and personal health environment (PHE). In addition, in 2007, Web of things acted as a new idea of the web that reflected the users not just a customer/user looking for information but as a would-be creator of the content. By using AI techniques the web of things services of next generation of web services. In short, web of things is the impression of next growth of WWW about integrating, analyzing, connecting data from different bases to gain new info flow. Web of things aims to link devices to exchanging data by several machines and generate new approaches between them[1]. This paper produces an idea of integrating web of things services with EH to construct knowledge society (KS).

2. The E–Health (EH) System

EH is defined as the health activity develops knowledge transfer and information utilization with particular interest to computer-based technology. EH is also defined as the use of information and computer technologies (ICT) to build up health experiences. It is a general term that describes technology that technologically or electronically supports health. EH is just-in-time knowledge integrated with high speed value chains. It is the delivery of comprehensive, individualized, active health content in real time, aiding the development of communities of facts, linking patient with experts. EH may either be synchronous or asynchronous. Synchronous health takes place in real-time, with all participants interacting simultaneously, while asynchronous health is self-paced and allows patient to exchange ideas or information with doctor in real time[2].

Gradually EH becomes an important part of health since it is identified as a creative and positive way for health communities. With the help of different EH tools communities are retied (through internet) for health (through the production and availability of online health resources). With the incorporation of digital media into health the health environment is turned to virtual consulting room which is termed as virtual health environment (VLE). It provides anywhere/anytime health irrespective of geographical limitation. To fulfill the health needs, the essentiality of EH is stated as follows in next section[2,3].

3. Essentiality of E-Health (EH) in Modern Society

This section provided some of point Essentiality from e-health particular for every patient

١. To provide customized and consistent information depending on need
Every patient should get the same form, in the same content.
٢. To provide reliable and timely content
Content should be updated straight away, to give more exact content.
٣. To provide 24/7 health
Due to the web of things-based nature, EH is available to patient anytime and at anywhere of the day.
٤. Standardization of Health
The web of things-based nature of EH can be able to provide virtually the same time at same content regardless of the various operating systems and platforms.
٥. Growing the Scalability
EH solutions are highly scalable. Systems can move 10-100 or even more participants with low cost and with little effort.
٦. Cost-Effectiveness
EH is often the most cost effective way to deliver information as it slices up travel expenses and can also reduce consulting time, and significantly reduces the physical need for a clinic/doctor infrastructure.
٧. Generating Knowledge Society (KS)
EH can enable specialists to collaborate and form health communities by create knowledge and sharing KS.

4. Elements of E-health (EH) System

Depending on the essentialities number of architectures has been proposed for EH from time to time. Among those the framework given [2,4] clearly describes the EH environment divided into three layers with nine different functional components. The integration of web of things services with these components can lead the society for the successful implementation of virtual health environment (VHE) where permanent flow of knowledge can advance the health environment with the optimism to create a KS. The components are described as follows[2]:

1- People (doctors or patients) and ICT experts

This part emphasizes doctors and patients since they establish physical contact Also, IT administrators, facilitators, and personnel with experience in the revision of content for EH are vital components of EH system.

2-Technical suitable and infrastructure environment

Technical facilities include software and hardware different interfaces for users (doctors and patients) as key components of EH system. Suitable good health environment for health with technological infrastructures are major components of an EH system.

3- Communication resource, tools and knowledge sharing

Communication tools such as network and the internet of doctors and patients who exchange information are major components of an EH system. From technological view, the high speed of Internet or Intranet, as well as the internet and computer connections are significant components of EH systems. Knowledge or/and Resources sharing is one of the important components of an EH system for the construction of KS.

4- Digital resources, knowledge content and course management

Audio and video files are main components of an EH system. Digital resources/contents and content capture, shape, share and upload of the contents are main components of an EH system. Content management and content development are the important components of EH systems.

5- Evaluation and Feedback

An evaluation or/and monitoring system is one of the significant components of an EH system to ensure that the system is efficient. Progress tracking, including assessment and feedback, etc. are significant components of an EH system.

5. Integration of Web of things Services with EH

The technologies and tools of web of things could better assist new models of design for EH that will better enable the workers and citizens to produce a KS. The use of Web of things technologies for health as "e-Health". Web of things is a chain of joint applications and the foundation software technology of web of things is artificial intelligence (AI), which can intelligently be trained and realize semantics. Therefore, the application of web of things technology enables the internet to be more accurate, personalized and intelligent. Availability of new technologies of collaborative intelligent filtering, cloud computing, dependable and bigger data storage capacity, multi gesture devices, higher screen resolutions, and 3D touch user interface leads us into the next generation of EH (e-health)[1,5].

5.1 Services of Web of things

The idea of the Web as an application-layer for the IoT started to emerge in 2007. Several researchers started working in parallel on this concept, a common denominator for recent styles heading towards the 'Read-Write Web of things', allowing everyone to distribute resources on the web of things using collaborative and personal, open and simple publishing tools. The various health applications of web of things services are the following [6, 7, 8]:

✓Service agreement is a machine- route able explanation. It shows:

- The functional semantics (e.g., facilities),
- Non-functional semantics (e.g., features),
- Message explanation,
- Agreement, policy requirements.

Abstract part (e.g., what is the idea of the service and its potentials), may be

includes:

١. Different realize (e.g., protocol and location),
٢. Designed and Planned, by the source,
٣. Existing package, reused from or existing industry average (e.g., UML /java interface, Oracle package),
٤. Generated/advanced separately.

For instance, a number of services might be applying the abstract fraction of the interface (labeling one function, the message inside and outside), each location has its service (where), communication protocol and access. The abstract part might be a java interface, UML / or as an industry standard interface.

✓Web services are organized within a run-time server. It might be inside an application server or standalone. The Web services holder is responsible of administration the execution life sequence of the application. At execution time, the user utilizes the proxy in order to build and show SOAP message.

The SOAP processor might be liable for:

- Handling of inward messages.
- Translating into native PL from XML data forms.
- Steering the request to the application.

5.2 Services of Web of things for EH

Web of things is considered as the semantic site for web of things which gives a turn in health sector by using smart interfaces. It uses all the tools of web beside its additional services. The web of things' technologies capable of producing large quantity of data, but they are all underutilize. AI techniques can be used to extract the forms in the large volume of data. To retrieve any content and digital/knowledge content can huge data technique can be used. The data produced by web of things is in free-practice with different forms. Thus, they cannot be processed, linked and utilized[8]. Developed linked data for distributing content and linking datasets on web of things[9]. Thus, linked data can also help in information sharing. Huge structure is very much important to analyze and process large set of data created by web of things. Cloud computing services can be in technological structure without obtaining the hardware/software by reducing economic burden. Interaction and 3D visualization can make the health environment much like physical clinic, by making a full range of tasks easier including skill interaction, manipulation of virtual objects and exploration of virtual spaces[10]. Enhance reality is a live, direct or indirect opinion of a real world which is been enlarged by computer. Including this technology can generate a suitable health environment by enhancing patient's understanding on reality while the virtual reality can change the real world with a virtual one. Semantic web of things allow machines to Process and search web of things contents, based on AI method. As it performances as a globally connected database, its integration into knowledge content and content management can help to

find contents available in several formats. In distributed computing, a duty can be undertaken by various computers. As a technological structure, distributed computing can speed up the process. Handed and wearable devices can also serve as technical infrastructure to offer ubiquitous health[5]. Some of the devices can be tablets, smart phones, PDA, hand/leg worn, hand held, head worn, etc.

The EH system can be adaptable one with the successful integration of web of things services. The proposed EH system is supposed to create more interactive VHE with this integration. The EH framework integrated with web of things services is given in fig1.[3]

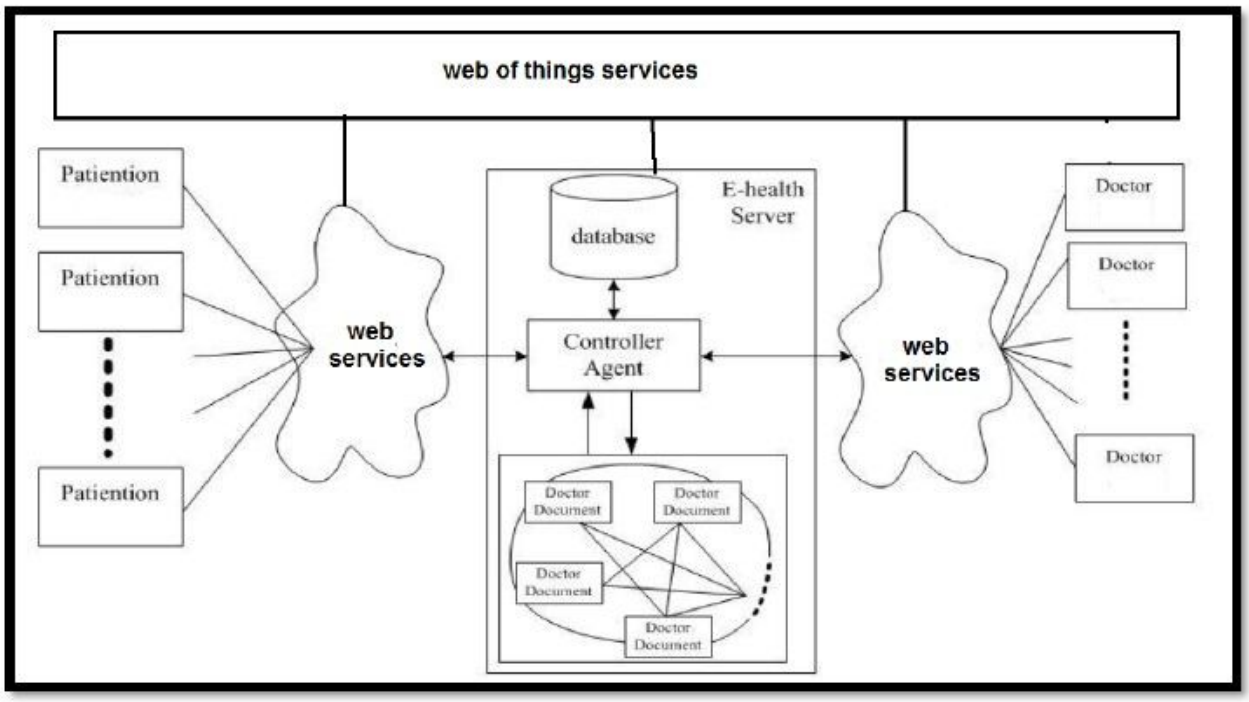

Fig.1: Integration of web of things services with e-health.

6. Discussion

The rapid development of technology to link everything to the Internet and became a request for information and respond to them directly, and that the health of the important things for people. In this research we studied the possibility of linking the web of Things services with e-health, the Doctor's look to the patient's case through connected to the web things and the patient consulted doctors to check on his health.

7. Conclusion

The greatest health challenge today is not only helping patient to acquire desired set of knowledge and skills, but also empowering them to learn how to succeed by working creatively to contribute to the KS creation. Health in a society of

knowledge should enable doctors/patient to participate in making of new knowledge as a usual part of their lives. Recent changes in health, the demands of the facts society and the increased need for patients to become independent, reflective has increased the need for health information to understand the health . A KS is invented to be formed with the effective of integration of web of things services and EH system. As such the integration of web of things services with ever, each component of EH system gives a new bearing to EH by allowing the doctor as the probable content producer. EH with web of things services, therefore, should generate new tools and forms of gathering data, storing knowledge and manipulating, converting information, and working together over time and distance to build a knowledge society professionally, and transfer universal knowledge efficiently to the new settings of social integrity. Thus, the above integration is a comprehensive perspective that squeezes the break between health requirements and patients and will ensure a new aspect to VHE for generating KS.

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